

Community Assistantship Program

**Supporting Data for the Series of Analysis Maps
Created for the Minnesota Trails Initiative
Granite Falls to Skalbakken Park Trail Study**

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Prepared in partnership with
The Minnesota Trails Initiative

Prepared by
Dan Petrik & Jeff Zeitler
Graduate Students

University of Minnesota
August, 2001

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Prepared By Dan Petrik and Jeff Zeitler
Department of Landscape Architecture, University of Minnesota
August 2001

Project Background

The Minnesota Trails Initiative (MTI), a non-profit organization in Southwest Minnesota is interested in recreational trails in the Minnesota River Corridor as an economic development tool for the region. MTI has supported the development of the existing trail from Montevideo to Wegdahl and is supporting the current extension of that trail to Granite Falls. This trail is expected to be completed over the next two years. Currently, MTI is interested in evaluating development potential for the next trail segment from Granite Falls to Skalkakammen Park in Renville County. Dan Petrik and Jeff Zeitler, graduate landscape architect students at the University of Minnesota, were hired (with funding by the Community Assistantship program administered through the Center for Urban and Regional Affairs) to complete a site analysis for this section of the Minnesota River.

Study Area Defined

Recreation trails have been successful in other regions of Minnesota as an economic development tool to encourage tourism. The segment of the Minnesota River valley studied for this analysis has incredible scenic beauty and significant historical meaning that offer good potential for tourist related recreational trail development. The beauty and much of the history in this region are contained within the river valley and surrounding bluffs, therefore, the valley bluffs were used as the boundaries for the study area.

Acknowledgements

We would also like to thank Holly Larson of the National Park Service and Terry Dinesen Park Manager for the Upper Sioux Agency State Park for their help and guidance. They provided many of the resources used to complete this project. We would also like to thank the Center For Urban and Regional Affairs (CURA) and the Department of Landscape Architecture at the University of Minnesota for funding this project. . We also wish to extend our appreciation to Steve Roos and CJ Fernandez, (Research Fellows in the Department of Landscape Architecture at the University of Minnesota- Twin Cities) for computer and technical support in completing this project. We owe great thanks to the Minnesota Department of Natural Resources and their "Data Deli" Website, which has provided us with much of the information we have used to create maps for this project. .

Data/Map Compilation

All of our maps were created using the 3.2 version of ARCVIEW, a GIS program created by ESRI. For the purposes of this study, we found it best to use aerial photos (also known as "DOQ's") as the background for all of our maps. These are easy for almost anyone to understand, as they are a direct black and white representation of the land surface, with little mechanical alteration. All images were laid over them to form composite maps. Therefore, all areas which appear as a shade of gray are simply areas which are not affected, or not included in the coverage that a particular map is showing.

In addition, on most maps we outlined the boundaries of the Upper Sioux Community, Upper Sioux State Park, Skalkakammen County Park and Memorial County Park in either white or black, depending on the other colors used in the maps. County and City Maps were used to define these specific features.

All maps in this series will be explained in greater detail on the following pages and the assumptions we have made as well as the sources of data will be identified. We hope that you will find it useful.

This data is meant to be used for analytical purposes only. This should not be construed as a finished construction document. A construction drawing by a qualified Landscape Architect or

Civil Engineer will be necessary to plot the precise route of the path. All assumptions are made in good faith by Dan Petrik and Jeff Zeitler, and all actions taken by the MTI Board of Directors based on this data are solely the responsibility of MTI. Dan Petrik, Jeff Zeitler, CURA and the University of Minnesota are not liable for any damage that may arise due to use or misuse of this data.

Land Use Type Map

Purpose: This map provides information from a land use planning perspective using a color coded key. Land not color coded is presumed under cultivation, however this map does not include environmental easements, so some land may appear under cultivation when it has actually been removed from agricultural use. The map provides guidance on land uses, such as residential, that are generally not desirable for recreational trail use.

Data Sources:

Name: Land Use

Originator: Land Management Information Center (LMIC) (International Land Use/Land Cover.

Date: 1990

Corridors and “Regulated” Land Use Map

Purpose: This maps shows land uses that follow corridors (utilities and roads) and lands affected by regulations (wetlands and environmental easements) that may help or hinder trail alignment. Trail alignments could take advantage of existing utility or road easements. On the other hand, the regulations affecting wetlands and environmental easements could make trail placement more difficult.

Data Sources:

Name: Roads

Originator: Minnesota Department of Transportation

Date: 1996

Name: Utility Corridors

Originator and Dates: Yellow Medicine County Highway Map (1996), Renville County Highway Map (1996), Chippewa County Highway Map (1994). Data was directly digitized onto these maps using the existing county highway maps as guides.

Name: Protected Wetlands

Originator: Minnesota DNR, Division of Waters

Date: 1991-94

Note: Data from the National Wetland Inventory was used to create this coverage. Protected wetlands are defined as categories 3 – 5 within the Circular 39 classification type system. The DNR typically regulates these open water wetlands and would require replacement if any were filled for development. Shown boundaries are approximate indicators of these wetlands. Field verification of wetlands by the regional hydrologist in New Ulm is necessary to define actual boundaries and setbacks for trail construction.

Contact: Dave Leuthe, DNR Regional hydrologist, 507-359-6050 (New Ulm). Erv Berglund, Wetland Hydrologist, 651-297-4601 (St.Paul).

Name: Environmental Easements

Originators and Dates: Minnesota Board of Water and Soil Resources (BWSR), 1996 – 2001. Yellow Medicine County (soil and water conservation dept.

Note: Data was a compilation of electronic ArcView compatible data acquired directly from BWSR (not the DNR Data Deli) and interpretation of hand drawn easements for the entire study area acquired from Yellow Medicine County (Contact Name here). The BWSR data did not appear to be as comprehensive as that obtained at the local level. The local soil and water departments record an easement after local application and acceptance. The state BWSR

records an easement only after acceptance at the state level and after payment is made. A brief description of the various easements follows below.

Contacts: Conner Donnely, State BWSR GIS Specialist, 651-282-3815 (St. Paul)
LouAnn Nagel, Yellow Medicine County,

Water Bank Program (WBP) -- A federal (USDA) program to set aside wetlands for a period of 10 years (renewable) for conservation purposes. Participants receive annual rental payments. As these contracts expire, participants are offered the opportunity to place the land in the Wetland Reserve Program.

Wetlands Reserve Program (WRP) – A federal (USDA) program to provide long-term protection for wetlands. Producers enrolling in the program must agree to implement an approved wetlands restoration and protection plan. In return, participating producers receive payments based on the difference in the value of their land caused by placing an easement on a portion of it. USDA is required to divide new enrollments among permanent easements and 30-year easements. Previously, all enrollments had been permanent easements. The Emergency Wetland Reserve Program (EWRP), which purchases easements on damaged acreage after floods.

Conservation Reserve Program (CRP) – A federal (USDA) program that reduces soil erosion, protects the Nation's ability to produce food and fiber, reduces sedimentation in streams and lakes, improves water quality, establishes wildlife habitat, and enhances forest and wetland resources. It encourages farmers to convert highly erodible cropland or other environmentally sensitive acreage to vegetative cover, such as tame or native grasses, wildlife plantings, trees, filter strips, or riparian buffers. Farmers receive an annual rental payment for the term of the multi-year contract. Cost sharing is provided to establish the vegetative cover practices. Typical contract is for 10 – 30 years.

Reinvest in Minnesota Program (RIM)- RIM is a state program that uses a combination of state tax dollars and private donations to fund natural resource protection on both public and private lands. The private lands program of RIM, known as RIM-Reserve, pays landowners for conservation easements that retire fragile and environmentally sensitive lands from agricultural production. RIM-Reserve is administered through the Board of Water and Soil Resources. Interested landowners should apply directly to their local Soil and Water Conservation District office (SWCD).

Conservation Reserve Enhancement Program (CREP) – A state/federal program to put conservation easements on up to 100,000 acres in the 37-county Minnesota River valley. Approximately \$98 million in federal funds are available until September 2002.

The 2001 Minnesota Legislature approved the final funding package for CREP, with \$51.4 million (\$43 million for easement purchase and approximately \$8.4 million for implementation) earmarked in the bonding bill. That funding paves the way for the state to move ahead with the final implementation of the program. Prior to the 2001 session, approximately \$30 million in state funds were appropriated and were matched by approximately \$65 million in federal funds.

Land Use Composite Map

Purpose: This map is a combination of the Land Use type and Corridors and “Regulated” Land Use maps. It provides a color-coded description of all the cultural or land use issues being considered in trail alignment. No new data is introduced on this map.

Wetlands, Open Water and Floodway Map

Purpose:

This map charts the hydrological issues within the study area. The areas in blue or green are wetland, open water or floodway.

Data sources:

Name: Protected Wetlands

Originator: Minnesota DNR, Division of Waters

Date: 1991-94

Note: Data from the National Wetland Inventory was used to create this coverage. Protected wetlands are defined as categories 3 – 5 within the Circular 39 classification type system. The DNR typically regulates these open water wetlands and would require replacement if any were filled for development. Shown boundaries are approximate indicators of these wetlands. Field verification of wetlands by the regional hydrologist in New Ulm is necessary to define actual boundaries and setbacks for trail construction.

Contact: Dave Leuthe, DNR Regional hydrologist, 507-359-6050 (New Ulm). Erv Berglund, Wetland Hydrologist, 651-297-4601 (St.Paul).

Name: Floodway

Originator: Federal Emergency Management Agency (FEMA).

Date: Unknown

Note: The floodway shown on the map is the portion of the 100-year floodplain that is characterized by deep or fast-moving water during a flood. These are more difficult to build on than the “floodplain,” or the area of the 100-year flood that has slower moving or more stagnant water. The floodway is more likely to cause erosion and land wasting of trail surfaces and associated structures.

Name: Open water

Originator: Land Management Information Center (LMIC) (International Land Use/Land Cover.

Date: 1990

Note: Data has been derived from analysis of aerial photos, most taken in 1990. Site visit may be necessary to verify actual existence and size. All areas classified as “50” (open water) are shown in dark blue on the map.

Land Use Constraints Map

Purpose: To evaluate the land use issues introduced on the previous maps and identify constraints to siting a recreational trail. No new information was added to this map. The colored areas on the previous maps were converted to red to illustrate where the most and least constrained areas for creation of a recreational path are. Areas with solid red coverage are most difficult to build upon, while areas in pink, or in red hatching are seen as easier to build upon. Areas with no red, pink, or red hatching are seen as having few to any natural barriers to construction. All issues were evaluated and classified into four categories: highly constrained, moderately constrained, minimally constrained or no constraints. Issues posing no constraints were not mapped to simplify map readability.

This technique is based on the technique pioneered by Ian McHarg, the late Landscape Architect. His method overlays constraints, or areas which do not work well for a certain purpose, to create a composite map showing where not to build. As a result the areas of the map with the least color showing are seen as the most desirable places to build.

All areas covered in red or pink on this map must **not** be interpreted as being places on which to avoid building at all costs. The areas with the most red and pink also happen to be most scenic, and a well-built trail that avoids some, but not necessarily all of the difficult areas would work best as a recreational trail. It must be remembered that one major purpose of building a recreational trail is to take users through beautiful scenery, and the scenery within the Minnesota River valley is well worth showing off.

Evaluation Rationale: Protected wetlands and any residential ownership or development was considered to be off-limits or highly constrained for trail development. Wetland regulations prohibit any type of development and homeowner resistance to trail development near dwellings was assumed to be too high to merit consideration.

Both the DNR managed Scientific and Natural Areas (SNA's) and Environmental Easements were considered to be moderately constrained. The DNR generally does not allow any type of development on SNA's, however, there may be opportunities to negotiate in situations where there is very limited impact on the natural environment. Each environmental easement program differs with regard to allowing uses and the issue of placing recreational trails across these easements has not been fully explored. MTI has an opportunity to forge a new policy framework at the state and federal level pertaining to recreational trails and environmental easements.

The 100-year floodway is considered a minimal constraint primarily due to practical reasons. The floodway nearly covers the entire valley floor and if considered a significant constraint would result in no recreational trail. While there have been two 100 year floods in the past ten years, the assumption is that this is still a rare occurrence and a recreational trail built within the floodway would not be subject to frequent flood related damage. Within the floodway, steps should be taken to design the trail for occasional flooding.

Natural and Land Use Constraints Map

Purpose: This map is a combination of the Land Use Constraints with Slope data added.

Data sources:

Name: Slope

Originator: U.S. Geological Survey

Date: 1988

Note: All slope information was taken from Digital Elevation Model (DEM) coverages assembled from data collected by The US Geological Survey in 1988. This data was acquired in 30-meter sampling intervals, and therefore may appear pixilated in the large maps we have created.

Slopes are shown in percent (Rise over run, i.e. 100% is equal to a 45 degree slope) and are broken up into four categories:

0-8% slope- Not considered a constraint and not mapped. Some care should be taken to avoid extended climbs directly up a 5-8% grade, particularly if the path is a bicycle path, but overall the area is well suited for path construction.

8-15% slope- Minimally constrained. These slopes are too steep for many bicyclists and walkers to directly climb. Paths may run parallel to these slopes, or gently ascend it with relatively little difficulty; however, there is greater chance of erosion resulting from path construction path in these conditions and higher costs.

15-25% slope. Moderately constrained. These slopes are too difficult for almost any recreational user to directly climb, and are a serious hazard in the winter. Paths may be constructed parallel to the slope, but some earth moving and alteration of the slope will be necessary. This is still a buildable area, but at an even higher risk of erosion and expense.

25%+ slope. Highly Constrained. No paths should be built directly up these slopes and any parallel paths along this slope should be built with extreme caution. Any path built may be subject to ongoing problems with erosion and undermining. Will probably require extensive alteration of the slope or retaining walls. Building paths along these slopes would be expensive, or if done cheaply, would require expensive ongoing maintenance. Avoid these slopes if at all possible.

Visual, Cultural and Natural Amenities Map

Purpose: This map shows features that visitors to the study area may find interesting or useful. It also gives a rough estimation of the type of scenery in various parts of the area.

Data sources:

Name: Natural and unique features:

Originator: Minnesota DNR: Division of Fish & Wildlife, Ecological Services Section. Natural Heritage & Nongame Research program

Date: 2001 (not yet released to public)

Note: Each colored dot represents an individual or community of rare plant or animal species seen in the area. Examples of such include Bald Eagles, the Regal Fritillary (an endangered butterfly), and an intact stand of old Maple-Basswood forest. It also indicates the presence of unique geological formations. Greater data detail is available, however, license agreement with DNR discourages this out of concern for rare and endangered species.

Contact: Shannon Flynn, GIS Support Specialist, Natural Heritage Program, Minnesota Department of Natural Resources, shannon.flynn@dnr.state.mn.us

Name: View sheds:

Originator: Personal observations by Jeff Zeitler

Date: July 2001

Note: View shed data is meant to be a rough approximation of the scenery in a given area, and is divided into urban, gneiss outcrops, and valley views.

Urban: This area is primarily urban, characterized by houses and commercial areas.

Gneiss outcrops: This is a unique landscape characterized by exposed stone outcrops and unusual animals and plants (e.g. skinks and prickly-pear cactus) This is a landscape not found in other regions of Minnesota, and could be a drawing point for people coming from outside the region to use the trail.

Valley views. These areas are typically wooded or wetland. They are green and lush, and views focus on the river. A calming and pleasant view for most recreationists. Views are best when looking up from the valley floor, rather than down at the river from the top of the valley.

Name: Other features

Originator: Minnesota DNR

Date: Unknown

Note: Features such as camping site locations, current trail end, historic sites, boat landings and other features were taken from the non-digital Montevideo area Public Resource Inventory Map (PRIM) compiled by the Minnesota DNR. Other data was taken from the map of Upper Sioux Agency State Park, and from personal communications.

Cultural Opportunities Map

Purpose: This map creates a McHargian- style map which outlines the natural and manmade opportunities on which to capitalize in the study area. All opportunities are shown in green. All data except the following were included on the Visual, Cultural and Natural Amenities map.

Data sources:

Name: Road Right of Way Availability

Originator: Dan Petrik

Date: August 2001

Note: This information describes the absolute difference between the shoulder-to-shoulder road width and the right-of-way width for key roads in the study area. Personal conversations were conducted with each county's highway engineer to gather this information. The result shows that some roads have more available space that could conceivably be used for a recreational trail. An individual inspection of each road section is critical as much of this "available" space would be comprised of drainage, steep slopes or other uses. According to each engineering office, there are no known plans to expand or enhance these roads over the next five years with the exception of CSAH 44 in Yellow Medicine County.

Contacts: Chippewa County Engineer, Steve Kubista (320-269-2151), Renville County Engineer, John Brunkhorst (320-523-3759), Yellow Medicine County Engineer Office, Brad Froland (320-564-3331).

Proposed Trail Alignments Map

Purpose: This map shows two primary alternative alignments against a backdrop of all considered cultural and natural constraints and opportunities. Assigning different importance rankings to the various natural and land use constraints drove the analysis for the two alignments. Only through a small section of the valley corridor south of Granite Falls and on the west side of the river was there an option of a third alternative.

A general assumption that the trail alternatives would be within the valley and not on the surrounding upland prairie was maintained. The following ranked selection criteria (in order of importance) were used for analyzing and selecting the alignment alternatives.

River Edge Route Alignment

- Avoid protected wetlands, residential land and Scientific and Natural Areas
- Avoid slopes in excess of 15% (cost and erosions)
- Locate as close to the river's edge as possible.
- Avoid environmental easements
- Avoid the floodway.

Middle Route Alignment

- Avoid protected wetlands, residential land and Scientific and Natural Areas
- Avoid slopes in excess of 15% (cost and erosions)
- Avoid environmental easements
- Avoid the floodway.
- Locate as close to the river's edge as possible.

Valley Edge Route Alignment

- Avoid protected wetlands, residential land and Scientific and Natural Areas
- Avoid environmental easements
- Avoid the floodway.
- Avoid slopes in excess of 15% (cost and erosions)
- Locate as close to the river's edge as possible.